

OBSERVATIONS IN RELATION TO CATEGORY ASSESSMENT

CARBON DIOXIDE REMOVALS – PART III

SEPTEMBER 2026

1. Purpose of these observations

The Governing Board (the Board) of the Integrity Council for the Voluntary Carbon Market (ICVCM), when considering the assessment of methodologies related to Carbon Dioxide Removals identified that it would be beneficial to make available their observations for the purpose of supporting the future development of methodologies in this Category.

These observations are non-binding and do not impact or form any part of the Assessment Framework, Assessment Procedure, or any Decision (as defined under the Assessment Framework) and are published by the ICVCM for the purpose of information only.

The ICVCM may, from time to time, publish other observations for other Categories where it considers this may be useful for CCP-Eligible Programs and other stakeholders, and may update and revise its observations from time to time based on further assessment processes or information. Observations are not an exhaustive set of views of the ICVCM, and not all aspects addressed in assessment processes are included. No reliance may be placed on observations, as they are for the purpose of information only, and observations published are without prejudice to other ongoing assessments.

The Governing Board would like to express its gratitude to the experts and other stakeholders engaged in the assessment process who provided input to the ICVCM regarding this Category.

2. Category Details

The Carbon Dioxide Removals (CDR) Category covers all engineered removals technologies that capture carbon dioxide from a source (e.g., a power plant, or directly from the air) and then store the carbon dioxide in a stable form (e.g., an underground reservoir, or in a product). Methodologies covering these technologies tend to provide several different monitoring and calculation approaches reflecting different types of sources and stores and thus cannot be categorised by a single mitigation activity type. Methodologies that cover a discrete mitigation activity type, for example Biochar, Enhanced Rock Weathering and Ocean Alkalinity Enhancement are categorised by ICVCM accordingly.

Engineered carbon dioxide removals are distinct from natural removal mitigation activities, like Afforestation or Reforestation, for example, because the technology, or process, is man-made and goes beyond natural processes. Engineered carbon dioxide removals technologies have typically yet to reach significant maturity and scale and will

require significant investment and support if they are to do so. These technologies are widely considered essential to decarbonise hard to abate sectors, like cement and steel production¹, that have requirements for high energy intensity as well as inherent process emissions (emissions released during industrial processes unrelated to energy consumption).

3. Observations relating to CDR methodologies

The Governing Board's observations regarding the assessment of CDR methodologies against the ICVCM Assessment Framework and its Core Carbon Principles generally relate to additionality, permanence and robust quantification.

VM0049 – Carbon Capture and Storage (version 1.0²) applied under VCS is the only methodology to which these observations relate. The Governing Board notes that other methodologies in this Category remain under assessment.

4. Permanence

Mitigation activity types with a material risk of reversal are listed in the Assessment Framework and must comply with a clearly defined set of monitoring and compensation requirements to address potential reversals³. CDR mitigation activities are required to address any identified risks using measures appropriate to that risk, rather than solely rely on use of monitoring and compensation. The risk of reversal differs according to the type of storage employed by the CDR mitigation activity in the methodology. Activities relying on geochemical storage or mineralisation generally have a low reversal risk.

Activities relying on storage in underground reservoirs, aquifers or similar, have measures relating to proving the integrity of the storage approach, ongoing monitoring of the storage and contributions to a buffer pool in the event that a reversal occurs. These measures in VM0049 module VMD0058 were assessed as being appropriate to the level of risk and, therefore, in line with the relevant requirements in the Assessment Framework.

The Governing Board notes that CDR may comprise novel storage technologies and that some countries may not yet have national regulations governing subsurface CO₂ storage and the regulatory landscape for this technology type is likely to evolve. The Assessment Framework requires CCP Eligible programs to require mitigation activity proponents to comply with national and local laws⁴. Given the fast pace of development in this sector, it is possible national/local regulation may not keep pace with emerging technologies and

¹ [IPCC](#), AR6 WGIII Factsheet

² The methodology refers to numerous related modules labelled as “VMD00XX” that are under development; only modules VMD0056, VMD0057-59 v1.0 have been assessed.

³ Please refer to ICVCM [Assessment Framework](#) 9.1 (b)

⁴ Please refer to [ICVCM Assessment Framework](#) 7.1 (a). 1

practices. The Governing Board, therefore, expects CCP-Eligible Programs to remain attentive to this issue and consider requiring the best available practices in subsurface storage where regulations are not in place or not designed to support CDR technologies.

5. Robust Quantification

A core element of high-integrity carbon markets is ensuring that GHG emission reductions and removals are quantified using complete, conservative, and scientifically robust approaches. In assessing methodologies within the CDR category, the Governing Board considered several key quantification issues.

VM0049 v1.0 does not require the proponent to account for construction-related emissions. Available literature suggests that these emissions may amount to approximately 15 gCO₂ per kgCO₂ captured, equivalent to around 1.5% of credited removals. While this omission was not considered material to this assessment outcome, the Governing Board highlights that accounting for construction-related emissions may be necessary in some cases to ensure a more complete and robust quantification of project emissions.

The Governing Board notes the importance of robust accounting for biomass feedstocks, including associated leakage, project emissions and risks. For example, if feedstocks are sourced from areas with an associated change in land use, these emissions could outweigh any removals achieved by the project. Methodologies in this category typically address a range of leakage and project emissions related to biomass feedstock by using a layered approach to address risks. This includes eligibility criteria which exclude highest-risk biomass (often limiting applicability to biomass residues, or other sustainable sources), or eligibility criteria that eliminate the possibility of leakage, as well as requirements to quantify any risks that cannot be minimised. VM0049, through its bioenergy module VMD0059, applies each of these layers: it excludes ineligible feedstocks outright and requires biomass products to meet an approved regulatory programme, certification scheme or equivalent; it removes market leakage by design and quantifies the remainder.

As observed in Section 4. Permanence, and in prior Decisions⁵ the Governing Board notes the novel nature of the CDR category and recognises that further research and empirical testing of engineered removal technologies may identify new risks, and it will be attentive to these as part of general ICVCM ongoing assurance and oversight.

The Governing Board notes that methodologies with this category may allow mitigation activities to account for emissions from project energy use directly and through energy procurement approaches which may include grid wheeling, power purchase agreements

⁵ 18th Sept 2025 Observation available [here](#)

(PPAs) and energy attribute certificates (EACs). Such procurement approaches can be an important consideration for some mitigation activity types within this nascent category and continue to be under active consideration by ICVCM.

Renewable electricity procurement approaches may raise a range of accounting considerations when used to support claims regarding the emissions associated with grid electricity consumption. The Governing Board has, through its decision in relation to this methodology, determined that the procurement approaches allowed in VM0049 are permissible under the Assessment Framework.

With regard to other methodologies or other approaches, where the ICVCM identifies risks in relation to integrity resulting from electricity procurement approaches, the relevant issues will be prioritized and be addressed through the CCP Rule Architecture⁶ in line with the governance and safeguards contained under that system.

The Governing Board highlights the importance of ensuring that renewable electricity claims are supported by appropriate safeguards against risks of double counting. Such risks may arise in different ways, for example, renewable electricity generation may support both renewable electricity claims and the issuance of carbon credits. In other cases, renewable electricity attributes may be claimed through contractual or certificate-based instruments while the same generation continues to be reflected in average grid emission factors that other consumers may apply.

Programs and standards commonly include provisions to mitigate double counting risks. Some accounting risks may require additional safeguards or accounting approaches, including mechanisms such as the residual electricity mix calculations that remove transferred renewable electricity attributes from the average grid mix. The availability of such approaches, and the supporting data required to implement them, varies across jurisdictions. The Governing Board encourages CCP-Eligible programs to remain attentive to these emerging issues and consider updating or revising their methodologies as and when appropriate.

⁶ More information at [CCP Rule Architecture website](#).